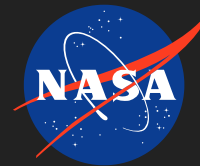


A Three-Dimensional Nanoporous Silicon Anode for High-Energy Density Lithium-ion Batteries, Phase I

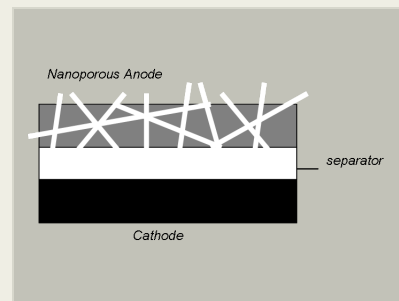
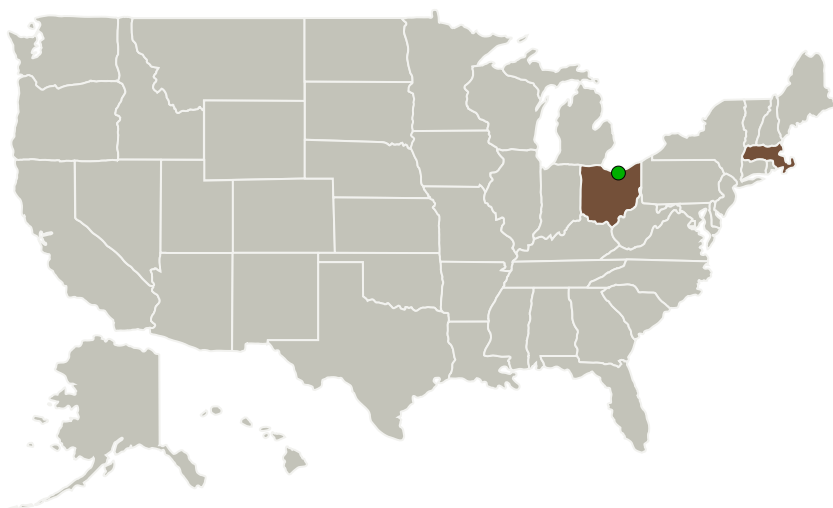
Completed Technology Project (2012 - 2012)



Project Introduction

This SBIR phase I program is directed toward the development of novel, nanoporous silica anodes for low-earth-orbiting (LEO) spacecraft power applications. Silica has attracted a lot of attention as a next-generation anode material because of its very high theoretical capacity compared to state-of-the-art graphitic carbon anodes. However, its use in Li-ion battery applications is limited by its poor cycle stability caused by large volume changes experienced during Li insertion and extraction. The unique pore structure of materials developed in this program will overcome this limitation and realize rechargeable Li-ion cells with high-specific energy and extremely stable cycle life for LEO spacecraft power applications.

Primary U.S. Work Locations and Key Partners



A Three-Dimensional Nanoporous Silicon Anode for High-Energy Density Lithium-ion Batteries, Phase I

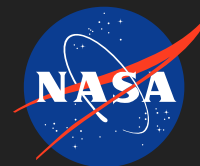
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Organizations Performing Work	Role	Type	Location
Giner, Inc.	Lead Organization	Industry	Newton, Massachusetts
● Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio

A Three-Dimensional Nanoporous Silicon Anode for High-Energy Density Lithium-ion Batteries, Phase I

Completed Technology Project (2012 - 2012)



Primary U.S. Work Locations

Massachusetts

Ohio

Project Transitions

February 2012: Project Start

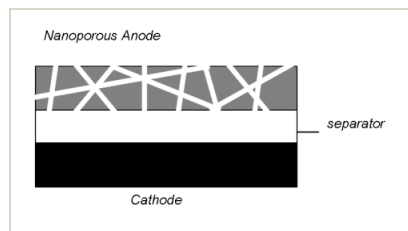
August 2012: Closed out

Closeout Summary: A Three-Dimensional Nanoporous Silicon Anode for High-Energy Density Lithium-ion Batteries, Phase I Project Image

Closeout Documentation:

- Final Summary Chart Image(<https://techport.nasa.gov/file/137928>)

Images



Briefing Chart Image

A Three-Dimensional Nanoporous Silicon Anode for High-Energy Density Lithium-ion Batteries, Phase I

(<https://techport.nasa.gov/image/130287>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Giner, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

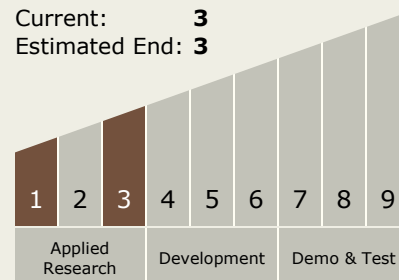
Carlos Torrez

Principal Investigator:

Castro S.t. Laicer

Technology Maturity (TRL)

Start: **1**
Current: **3**
Estimated End: **3**



A Three-Dimensional Nanoporous Silicon Anode for High-Energy Density Lithium-ion Batteries, Phase I

Completed Technology Project (2012 - 2012)



Technology Areas

Primary:

- TX03 Aerospace Power and Energy Storage
 - └ TX03.2 Energy Storage
 - └ TX03.2.1 Electrochemical: Batteries

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System